

VITA Intense and BOOST– Products with Natural Vitamins and Minerals for Health

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Abstract

We studied the mathematical model of interaction with water VITA intense and BOOST of LavaVitae company (Austria). In this report are submitted data about the interaction of VITA intense and BOOST with water, obtained by non-equilibrium (NES) and differential-equilibrium energy spectrum (DNES) of water. The average energy ($\Delta E_{H...O}$) of hydrogen H...O-bonds among individual molecules H_2O after treatment of VITA intense with water measured by NES- and DNES-methods is $\Delta E = -0.0136 \pm 0.0011$ eV for VITA intense and $\Delta E = -0.0114 \pm 0.0011$ eV for BOOST. These results suggest the restructuring of $\Delta E_{H...O}$ values among H_2O molecules with a statistically reliable increase of local extremums in DNES-spectra. The research is performed for VITA intense and BOOST, with study of pH and oxidative reduction potential (ORP). There is review of the effects of the chemical composition of VITA intense – anti-inflammatory, antioxidant effects, inhibition development of tumor cells and effects on nervous system. There is review of the effects of the chemical composition of BOOST – anti-inflammatory, energetic, stimulating etc. As results of these effects VITA intense has anti aging influence. The base of this influence is anti-inflammatory effect. This article deals with the review of the basic biophysical-biochemical and biological processes underlying the VITA intense and BOOST by LavaVitae company. The author is studying their physical-chemical properties and biophysical and biological effects on human organism.

Keywords: VITA intense, BOOST, anti-inflammatory, antioxidant, anti-aging, mathematical model, NES, DNES.

1. Introduction

Water is the main substance of life. The human body of an adult person is composed from 50 to 55% of water. With aging, the percentage of water in the human body decreases. Hence, the factor of water quality and its amount in organism is an essential factor for the research (Pocock *et al.*, 1981; Howard & Hopps, 1986). Water is present in the composition of the physiological fluids in the body and plays an important role as an inner environment in which the vital biochemical processes involving enzymes and nutrients take place. Water also is the main factor for metabolic processes and aging (Ignatov, 2012). Earlier studies conducted by us have demonstrated the role of water, its structure, the isotopic composition and physical-chemical properties (pH, temperature) on the growth and proliferation of prokaryotes and eukaryotes in water with different isotopic content (Mosin & Ignatov, 2012; Ignatov & Mosin, 2013a; Ignatov & Mosin, 2013b). These factors, the structure and composition of water are of great importance in many biophysical studies. The peculiarities of the chemical structure of the H_2O molecule and weak bonds caused by electrostatic forces and donor-acceptor interaction between hydrogen and oxygen atoms in H_2O molecules create favorable conditions for formation of directed intermolecular hydrogen bonds (O–H...O) with neighboring H_2O molecules, binding them into complex intermolecular associates which composition represented by general formula $(H_2O)_n$, where n can vary from 3 to 50 (Keutsch & Saykally, 2011). The hydrogen bond is a form of association between the electronegative O-atom and a H-atom, covalently bound to another electronegative O-atom, is of vital importance in the chemistry of intermolecular interactions, based on weak electrostatic forces and donor-acceptor interactions with charge-transfer (Pauling, 1960). It results from interaction between electron-deficient H-atom of one H_2O molecule (hydrogen donor) and unshared electron pair of an electronegative O-atom (hydrogen acceptor) on the neighboring H_2O molecule.

The product of LavaVitae VITA intense is combining of herbs from Alps, Aloe Vera, Green tea, Edelweiss, Aronia, Vitamins and Magnesium, Selenium. The research is with methods NES and DNES. There is research of ORP, E_h and pH and there are executing the conclusions from electrochemically activated waters – anolyte and catholyte for anti-inflammatory effects (Ignatov *et al.*, 2014).

The aim of this research is to show the usefully of VITA intense on the base of the following results and conclusions. The author also performed the research of 1% (v/v) solution of VITA Intense on the distribution of H_2O molecules according to the energies of hydrogen bonds, as well as studies of the NES and DNES spectrum and the biophysical effect of this type of water on human body. The product of BOOST is combining of Green Coffee, Green tea and Guarana and natural Caffeine. The research is with methods NES and DNES. There is research of ORP and pH and there are executing the conclusions from electrochemically activated waters – anolyte and catholyte for anti-inflammatory effects (Ignatov *et al.*, 2014). The aim of this research is to show the

usefully of BOOST on the base of the results and conclusions.

2. Materials and Methods

2.1. NES and DNES Spectral Analysis

The device for DNES spectral analysis was made by A. Antonov on an optical principle. For this was used a hermetic camera for evaporation of water drops under stable temperature (+22–24 °C) conditions. The water drops were placed on a water-proof transparent pad, which consists of thin maylar folio and a glass plate. The light was monochromatic with filter for yellow color with wavelength at $\lambda = 580 \pm 7$ nm. The device measures the angle of evaporation of water drops from 72.3° to 0° . The DNES-spectrum was measured in the range of -0.08– -0.1387 eV or $\lambda = 8.9$ –13.8 μm using a specially designed computer program. The main estimation criterion in these studies was the average energy ($\Delta E_{\text{H}\dots\text{O}}$) of hydrogen O...H-bonds between H₂O molecules in water samples and human blood serum.

2.2. Product of LavaVitae – VITA intense

The product LavaVitae VITA Intense of 1 liter is including – Natural and high quality plant extracts from the Swiss Alps, Aronia, Edelweiss, Aloe Vera, Vitamin C (180.0 mg), Vitamin E (15.0 mg), Vitamin A (17.0 mg), Vitamin A (17.0 mg), Vitamin B₁ (1.5 mg), Vitamin B₂ (1.7 mg), Vitamin B₃ (17.0 mg), Vitamins B₅ (10.0 mg), Vitamin B₆ (4.2 mg), Vitamins B₃ (17.0 mg), Water-soluble B Vitamin (17.0 mg) Vitamin B₉, Vitamin M, Vitamin B₁₁, (0.4 mg), Vitamin B₉, (7.4 μg), Vitamin D₃, (5.0 μg), Magnesium (62.5 mg), Selenium (25 μg).

2.3. Product of LavaVitae – BOOST

The product LavaVitae BOOST is including 200 mg Green Coffee, Green tea and Guarana and 204 mg natural Caffeine, Raw cocoa, Cordyceps sinensis, Acerola, Vitamin C.

2.4. Studying the Human Blood Serum

1% (v/v) solution of human blood serum was studied with the methods of IR-spectroscopy, non-equilibrium (NES) and differential non-equilibrium (DNES) spectral analysis. The specimens were provided by Kalinka Naneva (Municipal Hospital, Bulgaria). Two groups of people between the ages of 50 to 70 were tested. The first group (control group) consisted of people in good clinical health. The second group included people in critical health or suffering from malignant diseases.

2.5. IR-spectroscopy

IR-spectra were registered on Brucker Vertex (“Brucker”, Germany) IR spectrometer (a spectral range: average IR – 370–7800 cm^{-1} ; visible – 2500–8000 cm^{-1} ; the permission – 0,5 cm^{-1} ; the accuracy of wave number – 0,1 cm^{-1} on 2000 cm^{-1}) and on Thermo Nicolet Avatar 360 Fourier-transform IR.

2.6. Statistical Processing of Experimental Data

Statistical processing of experimental data was performed using the statistical package STATISTISA 6.0 using the Student's *t*- criterion (at $p < 0.05$).

3. Results and Discussions

3.1. Applications of VITA intense for Human Health. The information is from the company LavaVitae

Product features: LavaVitae Company –VITA Intense product

- One bottle (1,000 ml) covers up the need for a monthly (~ 33 ml per a day);
- A synergy of essential vitamins and minerals with natural high-quality plant extracts and aromas from the Swiss Alps;
- Highest bioavailability in liquid form;
- Without GMO. Free of animal ingredients and allergens according to regulation (EU) No. 1169/2011;
- Supports a healthy diet and an active lifestyle.

Vitamins and Minerals:

Vitamin A (0.75 mg)

Improve eyesight and the immune system. Contributes to the maintenance of normal skin.

Vitamin B Complex

It strengthens nerves and ensures continuous supply of power. In the bustle of everyday life and times of increased willingness to perform the essential water-soluble vitamins support the metabolism and increase the stress tolerance. Thus counteract against shiftlessness and fatigue.

Vitamin B₁ (1.5 mg)

Contributes to the normal function of the nervous system, psyche and heart.

Vitamin B₂ (1.7 mg)

Contributes to the normal production of red blood cells and metabolism of iron.
Protect cells against oxidative stress.

Vitamin B₃ or Niacin (17.0 mg)

Helps maintaining normal skin.

Vitamin B₅ or Pantothenic acid (10.0 mg)

Contributes to the normal synthesis and metabolism of steroid hormones, Vitamin D and some neurotransmitters.

Vitamin B₆ (4.2 mg)

Contributes to the normal metabolism of proteins and glycogen, to the normal production of red blood cells and regulating hormone balance.

Water-soluble B Vitamin other names: Vitamin H, Coenzyme R, Biotin (0.15 mg)

Helps maintaining normal skin, hair.

Vitamin B₉, Vitamin M, Vitamin B₁₁ (0.4 mg)

Contributes to the normal synthesis of amino acid, formation of blood and plays an important role in cell division.
Contributes to the normal growth of maternal tissues during pregnancy.

Vitamin B₁₂ (7.4 µg)

Contributes to the normal formation of red blood cells and plays an important role in cell division.

Vitamin C (180.0 mg).

Anti oxidant. Supports formation of collagen for skin, blood vessels and bone and aids in wound healing.
Protects cells from oxidative stress. Supports the immune system. Increases the excretion of heavy metals via the kidneys and improves iron absorption.

Vitamin B₃ (5.0 mg)

Sun Vitamin with a key function for your health

Contributes to the normal function of the muscles and maintaining normal bone and teeth. Contributes to the normal utilization of calcium and phosphorus and contributes to the normal calcium level in blood.

Vitamin E (15.0 mg)

Protect cells against oxidative stress and contributes to a young, tight and healthy skin. Increases the amount of collagen in the skin. Supports wound healing through the support of cell division.

Magnesium (62.5 mg)

Contributes to the normal muscle function and maintaining to normal bone and teeth. Supporting protein synthesis, regulates electrolyte balance and plays an important role in cell division.

Selenium (25 µg)

Contributes to the normal function of the immune system and the thyroid. Protect cells against oxidative stress.
Helps maintaining normal hair and nails as well as for normal formation of sperm. Natural and high quality plant extracts from the Swiss Alps. Extracts from plants provide an effective and long lasting protection against free radicals. For this reason Vita Intense contains a number of effective and health promoting extracts which are carefully matched to achieve an optimum synergistic effect with maximum bioavailability.

Aronia (*Aronia melanocarpa*)

The Aronia (Figure 1) or "Black chokeberry" originates from North America is now increasingly cultivated in Middle Europe, including Switzerland.



Figure 1: Aronia

The shell of the Aronia is naturally rich in vitamins (such as Vitamin A, C, E, K and the entire group of the B

Vitamins), minerals and trace elements (such as calcium, magnesium, potassium, zinc and iron). The Aronia shows record antioxidants levels for protecting cells against oxidative stress (Zheng, Wang, 2003). But the most interesting active ingredient is hidden in the group of polyphenols, whose main representatives are the flavonoids and anthocyanins. The Aronia contains an unsurpassed amount of flavonoids and the highest proportion of anthocyanins compared to other berries (Table 1) (Zheng, Wang 2003).

Table 1: Composition of different berries (Zheng, Wang 2003)

ORAC, Anthocyan- und Phenolgehalt der Beeren im Vergleich (nach Zheng und Wang 2003)

Beerensorte	ORAC (1mol Trolox Equivalent/g FG)	Anthocyane (mg Cyanidin-3-Glukoside/g FG)	Phenole (mg Gallussäureequivalent/gFG)
Blaubeere	28,9	1,20	4,12
Cranberries	18,5	0,32	3,15
Preiselbeere	38,1	0,45	6,52
Apfelbeere	160,2	4,28	25,56

Figure 2 shows the results of anti oxidative parameter of Aronia (mmol/l) for TEAC

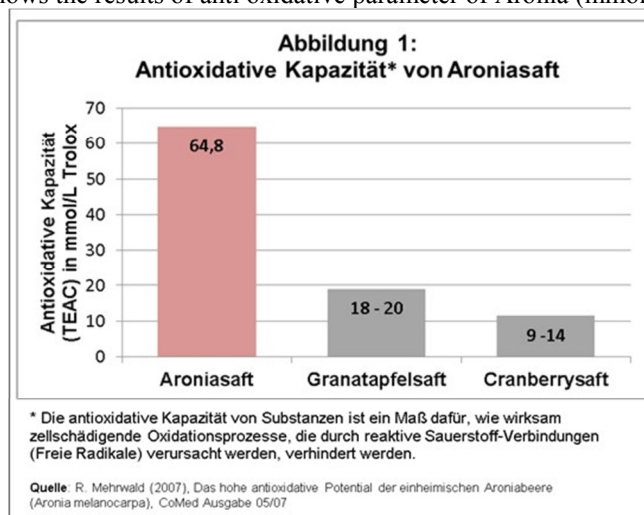


Figure 2: Oxidative parameter of Aronia (mmol/l) for TEAC

The Aronia has antioxidant (Olas et al., 2008), anti-inflammatory (Ohgami et al. 2005, Borisova et al., 1994), anti oxidative stress (Valcheva-Kuzmanova et al., 2005) antibacterial and antiviral effect (Kokotkiewicz et al., 2010). Further these antioxidants show positive effects on blood sugar (Ryszawa et al. 2005) and of blood lipid levels (Valcheva-Kuzmanova et al. 2006). They protect the heritage (~antimutagenic effect: Gasiorowski et al., 1997; Dimova et al., 1997), the cardiovascular system (Ryszawa et al. 2006), the gastrointestinal tract (Valcheva-Kuzmanova et al., 2005; Matsumoto et al., 2004) and the liver (Borisova et al., 2004). While flavonoids improve blood circulation and the cardiovascular system (via relaxation of the vessel walls), anthocyanins reduce platelet formation (Ryszawa et al., 2006). Both flavonoids show unsurpassed antiviral, antimicrobial, antiallergic and anticarcinogenic effects (Bermudez-Soto et al. 2006; Lala, Marlik, 2006; Zhao et al., 2004; Marlik 2003, Zhao et al. 2003).

Green tea (*Camelia sinensis*)

Green tea (Figure 3) has been shown to preventative against many diseases. Green tea has been proven for everyday primary care, prevention of mild illnesses or weakened constitution, improving fitness and metabolism or for setting an ideal weight. (Lambert, Yang. 2003).



Figure 3: Green tea

The extract of Green tea (*Camelia sinensis*) naturally rich in many vitamins, minerals and trace elements (calcium, iron, fluoride, potassium, manganese and magnesium), tea polyphenols and catechins (especially EGCG = Epigallocatechingallate). The combination of these powerful ingredients provides an antioxidative (Chan et al. 1997), anti-inflammatory, cardiotoxic (Hollman, Tjiburg, Yang, 1997) and cancer preventive effects (Lambert et al., 2003). Green tea contributes to the dental health, reduces deposits in the blood vessels and protects against atherosclerosis (Chacko et al., 2010). While the antioxidant properties are generally ascribed to the high content of tea polyphenols (Balentine et al., 1997), the positive influence on the

body weight is attributable to the caffeine and catechins. The caffeine/catechins combination stimulates metabolism, increases energy expenditure, fat digestion and resorption in the stomach and the intestine (Bartista et al., 2009). Furthermore, the German Medical Journal reported in April 2010 that the catechins contained in green tea (EGCG) harmless "toxic" plaques in Alzheimer's.

Aloe Vera

Sumerian and Egyptian records occupied that the "plant of immortality" or the "blood of the gods" has been used medicinally 5,000 years ago. Scientists were able to detect more than 200 active ingredients till today. The Aloe Vera (Figure 4) is naturally rich in polysaccharides, glycoproteins, vitamins, amino acids, enzymes and phytochemicals (such as essential oils, saponins, tannins, salicylic acid, sterols and aloin) in an unique pharmacological combination (Choi et al., 2001).



Figure 4: Aloe Vera

Esua and Rauwald reported 2005 of a novel bioactive glucan, which attributed to the significant anti-inflammatory effect. The Aloe further harmonized the metabolism in all organs by regulation of the basic substances and the acid-base balance. In folk medicine the "wonderful desert lily" shows an excellent effect in inflammation (especially in the gastrointestinal tract), skin diseases (especially in Eczema, Dermatitis and Psoriasis), sunburns and wound raptures (Vogler, Ernst 1999).

Edelweiss (*Leontopodium alpinum*) – Pure ingredients, real effect! The most famous and most symbolic flower of the Alps is naturally rich in antioxidants, terpenes, caffeine acid derivatives (Leontopodic acid) and Leoligin. So it is very popular in the cosmetic- (especially in UV-protective- and anti-aging products), food- and dietary supplement industries. In the Alpine region it is particularly known Edelweiss (Figure 5) as "Bellyache flower" (such as abdominal pain, indigestion, diarrhea or intestinal colic).



Figure. 5. Edelweiss

The secondary plant substances of the "Edelweiss" support in the prevention and treatment of gastrointestinal complaints (Dobner et al., 2003) and in respiratory-, neurologic-, muscular- and cardiovascular diseases.

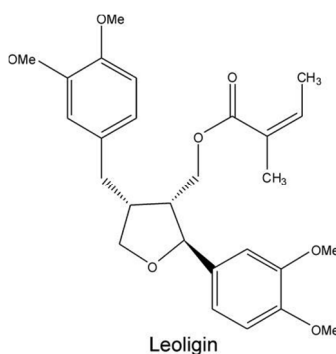


Figure. 6. The structure of Leoligin in Edelweiss

In addition to the outstanding antiinflammatory, antibacterial (Dobner et al. 2004) - even with infections (Stuppner, 2000) - and analgesic effects (Speroni et al., 2006) the "Edelweiss" shows a superior property as a scavenger and antioxidant (Schwalger et al., 2005) and preserves so cells from damage (also by molds; Costa et al., 2009). While Leoligin (Figure 6) proved highly effective against thickening of the inner wall of blood vessels (Reisinger et al., 2009), an unknown terpene shows a significant cancer hostile activity against human leukemia cells (Wang et al. 2007). Moreover (Hornick et al., 2008) can showed after taking an extract from the whole root an improvement in the capacity of memory and kick off a discussion for taking this extract in the prevention and treatment of dementia.

3.2. Applications of BOOST for Human Health. The information is from the company LavaVitae

Product features: LavaVitae Company – BOOST product

– Four vegetarian capsules contain ever 200 mg Green Coffee, Green tea and Guarana and 204 mg natural Caffeine.

– Purely vegetable. 100 % natural.

–NON - GMO. Free of animal ingredients and allergens according to regulation (EU) No. 1169/2011.

Vitamin C

Supports formation of collagen for skin, blood vessels and bone and aids in wound healing.

– Protects cells from oxidative stress.

–Supports the immune system.

–Increases the excretion of heavy metals via the kidneys and improves iron absorption.

The natural high quality ingredients in the LavaVitae-BOOST are derived from different plant sources such as caffeine - which bond on tannins - provides due to the "active substance cascade" the body fast and at the same time long-lasting (up to 6 hours or more) with caffeine.

Caffeine

For the human 400 mg of caffeine a day is considered safe for a 70 kg person (that is 5.7 mg per kg body weight) whereas more than 1.000 mg of caffeine seems to be an overdose. The main sources of caffeine are (green) coffee, (green) tea, cola, energy drinks and raw cocoa (chocolate). Typical energy drinks contain about 80 mg - usually of synthetic origin - and a cup of coffee about 50 to 100 mg of caffeine. Caffeine shows a broad spectrum of activity: Primarily a stimulant with effects on the psyche, concentration, impulsion and muscular peristaltic. At higher concentrations this stimulant in an increases heart rate, contractility of the heart, respiratory rate and further glucose and lipid metabolism. At the same time a vasoconstriction take place in the brain and a vasodilatation in the periphery. These effects are used specifically in prevention and therapies of migraine and performance increase in sports. Owing to a regular high coffee consumption numerous side effects were observed, such as accelerated pulse, irregular heartbeat, restlessness, sleeplessness and very strong vasoconstrictor effects - which may results in impotence. Caffeine requires approximately 30 to 45 minutes reaching the blood circulation. The degradation of caffeine takes place in the liver. Caffeine normally remains in the blood circulation up to 4 hours although there are people, in which the degradation takes longer and for this reason they should be careful with the consumption of caffeine after 16 am.

Green Coffee

In raw form coffee beans are green and contain less flavorings, but more functional plant compounds such as chlorogenic acid (a polyphenols), niacin (vitamin B₃) and fast and highly available caffeine. Green Coffee has more than 1.000 well known ingredients, from which many of these have not been explored till today. In addition to carbohydrates, lipids, proteins, minerals and alkaloids especially the chlorogenic- and caffeic acids are important. A total of 80 different acids are found in green coffee. Chlorogenic acids belong to the polyphenols, secondary plant substances with antioxidant properties. They are able to neutralize free radicals before these aggressive oxygen molecules arise constantly in the body and damage cell structures. Nevertheless caffeine which extracted first in 1820 remains the best known and most important ingredient in coffee.

The supposed "acidifiers" even has a slightly basic value. Studies suggest beneficial effects in the prevention and therapie of diabetes, depressions or Alzheimer's disease. It is believed that milk and sugar can reduce the positive effect or reverse them.

The positive effects of Green Coffee in an overview:

Coffee intake correlated with lower mortality;

Coffee reduces statistically significant the likelihood of a depression;

Coffee would not has a negatively impact on the cardiovascular system – in contrast, current studies suggest the opposite;.

The ingredients of coffee protect against diabetes and obesity;

Coffee enhances performance and increases statistically significant endurance capacity;

Coffee reduces statistically significant pain during exercise and increases the muscular performance;

Coffee promotes nerve-muscle interaction and acts also in short term exposure performance enhancing;

Coffee is ideal supplement in weight management;

Coffee acts against weight gain.

Guarana

The originally home of the evergreen Guarana plant is the Amazon region. Today it is cultivated in a number of other Latin American countries. In his home the bitter-tasting crushed Guarana seed has been used for centuries in form of a sweetened beverage. Due its invigorating effect Guarana is very popular in Europe for many years. Guarana releases caffeine more slowly and acts gentle on the stomach compared with Green or roasted coffee because caffeine is bound on other ingredient like tannins, fat, protein and fibers. Guarana increases the physical

and mental performance and decreases feeling of thirst and hungry. More than 20 g Guarana represents an overdose. The possible side effects are similar to those of coffee (such as increased irritability, sleeplessness, tachycardia ~ increasing heart rate, headache, tremors or muscle pain).

Green tea

The Green has been known already for several thousand years and first came to Europe in the 16th century. The tasty and stimulating beverage is made - like his brother, the black tea - from the plant "*Camellia sinensis*". Green tea isn't fermented, so the natural leaf pigment largely remains intact. Green tea has a wealth of health-promoting ingredients especially polyphenols (catechins as epigallocatechin gallate), essential vitamins (such as Vitamin A, Vitamin B₁ and B₂), trace elements and minerals (calcium (Ca), potassium (K), magnesium (Mg), copper (Cu), zinc (Zn)). The natural content of stimulating components (natural caffeine and Thein/Thein/Teein, which is chemically identical to caffeine) activates the body in a gentle and natural way. L-theanine - a natural amino acid in green tea - imparts inner balance and appears to be useful against the stress. The totality of these natural ingredients cause an antioxidative and antimicrobial effect and seem to have a positive influence on immune processes, inflammation and blood clotting and further has been associated with cancer inhibition, obesity, decrease in blood pressure and balancing effects on the gastrointestinal tract, however, not all effects can be confirmed by a study.

The positive effects of Green tea in an overview:

Green tea increases body fat burning and energy supply in everyday life and during exercises.

Green tea reduces inflammatory responses and muscular damage caused by sports and supports regeneration and recovery.

Physical stress caused by high endurance exercise and strength training is mitigated through the use of green tea.

L-theanine - an amino acid in green tea - has a strong anti-stress effect and counteract against depression.

Green tea polyphenols have a positive effect in obesity, cardiovascular disorders and diabetic conditions (on basis of blood-sugar-stabilizing effects;

Green tea reduces the likelihood of liver disease;

Green tea reduces inflammation, has an antibacterial and anticancer effect. It also lowers cholesterol levels and has a positive effect on the nervous system;

Green tea is powerful antioxidants. It protects the body against free radicals and reduces thereby the aging processes (anti-aging effect).

Raw cocoa

The cocoa bean grows in the pods on the up to 15 meter high cocoa tree (lat. *Theobroma cacao* = "Food of the gods!"). One of the main active ingredients in cocoa, theobromine, is derived from this statement. Arises in Latin America the cacao plant has spread all over the world. Already the Mayas and Aztecs enjoyed the taste of the cocoa bean and brewed a bitter sharp drink. Today is added a lot of sugar and cocoa mainly enjoyed in the form of sweet drinks and chocolate. Raw cacao has naturally no sugar but consists more than 50 percent of fat. In addition cocoa contains many beneficial substances such as health-promoting antioxidants (polyphenols) which are able to protect body cells against oxidative stress (anti-aging), theobromine and "slow" caffeine. The caffeine in cocoa is - as in green tea - bound to tannins and therefore it goes more slowly into the blood as caffeine from coffee. Cocoa ensures continuous provision of energy and impulsion. Among its more than 300 ingredients are the precursors to serotonin and dopamine, these neurotransmitters evoke a mood-lifting effect and can therefore mitigate depressions. Furthermore, a positive effect on the cardiovascular system and the elasticity of blood vessels is observed.

The positive effects of raw cocoa in an overview:

Cocoa supports maintaining healthy cognitive abilities of aged people (perception, attention, memory, learning;

Cocoa has a positive effect on the cardiovascular system and blood fats levels;

Cocoa is an "anti-aging" source and has positive effects on skin health (youthful complexion;

Cocoa should have protective effects on Alzheimer's disease and may contribute to brain health;

Cocoa is a powerful antioxidant and reduces oxidative stress during exercise (strong regeneration-promoting effects;

Cocoa makes happy and content;

Cocoa increases fat burning;

Cocoa improves endurance capacity;

Cocoa polyphenols have a positive effect on the sugar and insulin metabolism (stabilizing blood sugar levels; anti-diabetes effects;

Cocoa prevents against thrombosis and blood clots.

Cordyceps sinensis (greek. "kordyle" = club, "ceps" = head)

Is used in China for thousands of years and considered one of the strongest Qi-Tonics (Qi = vitality and energy). For a very long time its weight was outweighed in gold and it was only reserved for the king and his wife. Today one kilo of the dried *Cordyceps sinensis* costs approximately 24,000 euros (but the price varies greatly). Many

studies demonstrated the rejuvenating, ergogenic, organ revitalized, antidepressant and anti-mutagenic effects of the healing mushroom. *Cordyceps sinensis* gives new strength and vitality in contrast to caffeine which only increases existing energy. *Cordyceps sinensis* is naturally present in the Tibetan plateaus of the Himalaya and has been obtained originally in wild-collection. Its name in the traditional Chinese medicine means something like: "Worm in winter!", or "Grass in summer!". *Cordyceps sinensis* belongs to the sac fungus together with the morels and truffles and is an invasive fungi. They attack preys (animals such as caterpillars), eat them from the inside until they hit by the prey's body and at the end of the transformation they form a fruit shoot. Visible above the ground is than only a small blue-black, club-shaped part of the mushroom. Today it is obtained from high-quality cultures where it grows best on a natural substrate rather than on a caterpillar.

The positive effects of *Cordyceps sinensis* in an overview:

Cordyceps sinensis shows a statistically significant positive effect on energy implementation, -efficiency and -capacity;

Cordyceps sinensis acts as a strong performance-enhancer;

Cordyceps sinensis increases testosterone levels in men;

Cordyceps sinensis increases insulin sensitivity (anti-diabetes effect);

Cordyceps sinensis has a strong performance enhancing and liver protective effect.

Acerola (Synonym: *Antilles cherry*)

The Acerola shrub mainly grows in Central and South America and wears approximately spherical drupes. The Acerola fruits bursting with a very high vitamin C content (30 times higher than lemons) which giving them the name "Power Fruit". In contrast to ascorbic acid - which is synthetically produced - vitamin C from the Acerola shows a higher bioavailability because of many other synergistic ingredients (secondary plant substances such as bioflavonoids). The high quality of the fruit can be obtained best by freeze drying.

3.3. Clinical studies with human blood serum testing

A convenient method for studying of liquids is non-equilibrium differential spectrum. It was established experimentally that the process of evaporation of water drops, the wetting angle θ decreases discretely to zero, and the diameter of the water drop basis is only slightly altered, that is a new physical effect (Antonov, 1995; Antonov & Yuskesslieva, 1983). Based on this effect, by means of the measurement of the wetting angle within equal intervals of time is determined the function of distribution of H₂O molecules according to the value of $f(\theta)$. The distribution function is denoted as the energy spectrum of the water state. The theoretical research established the dependence between the surface tension of water and the energy of hydrogen bonds among individual H₂O-molecules (Antonov, 1995).

For calculation of the function $f(E)$ represented the energy spectrum of water, the experimental dependence between the wetting angle (θ) and the energy of hydrogen bonds (E) is established:

$$f(E) = \frac{14,33f(\theta)}{[1-(1+bE)^2]^2} \quad (1)$$

where $b = 14.33 \text{ eV}^{-1}$

The relation between the wetting angle (θ) and the energy (E) of the hydrogen bonds between H₂O molecules is calculated by the formula:

$$\theta = \arcsin(-1 - 14.33E) \quad (2)$$

The energy spectrum of water is characterized by a non-equilibrium process of water droplets evaporation, therefore, the term non-equilibrium spectrum (NES) of water is used.

The difference $\Delta f(E) = f(E_{\text{samples of water}}) - f(E_{\text{control sample of water}})$ - is called the "differential non-equilibrium energy spectrum of water" (DNES).

Thus, the DNES spectrum is an indicator of structural changes in water, because the energy of hydrogen bonds in water samples differ due to the different number of hydrogen bonds in water samples, which may result from the fact that different waters have different structures and composition and various intermolecular interactions - various associative elements etc (Ignatov et al, 2014; Ignatov et al., 2015). The redistribution of H₂O molecules in water samples according to the energy is a statistical process of dynamics.

Figure 7 shows the average NES-spectrum of deionised water. On the X-axis are depicted three scales. The energies of hydrogen bonds among H₂O molecules are calculated in eV. On the Y-axis is depicted the function of distribution of H₂O molecules according to energies $f(E)$, measured in reciprocal unit eV^{-1} .

Arrow A designates the energy of hydrogen bonds among H₂O molecules, which is accepted as most reliable in spectroscopy.

Arrow B designates the energy of hydrogen bonds among H₂O molecules the value of which is calculated as:

$$\bar{E} = -0.1067 \pm 0.0011 \text{ eV} \quad (3)$$

Arrow C designates the energy at which the thermal radiation of the human body, considered like an absolute black body (ABB) with a temperature $+36.6^{\circ}\text{C}$, is at its maximum.

A horizontal arrow designates the window of transparency of the Earth atmosphere for the electromagnetic radiation in the middle infrared range of the Sun toward the Earth and from the Earth toward the surrounding space. It can be seen that the atmosphere window of transparency almost covers the NES-spectrum of water.

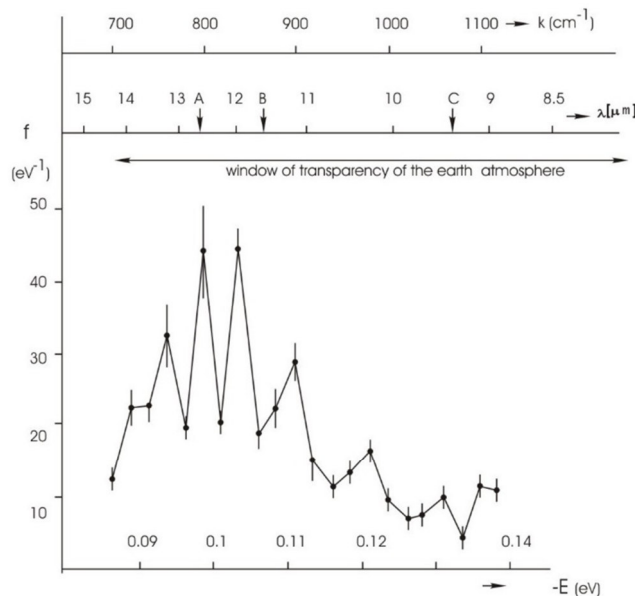


Figure 7: The NES-spectrum of deionized water (chemical purity – 99.99 %; pH – 6,5–7,5; total mineralization – 200 mg/l; electric conductivity – 10 $\mu\text{S}/\text{cm}$): the horizontal axis shows the energy of the H...O hydrogen bonds in the associates – E (eV); the vertical axis – the energy distribution function – f (eV^{-1}); k – the vibration frequency of the H–O–H atoms (cm^{-1}); λ – wavelength (μm)

We have conducted studies of 1% (v/v) solution of human blood serum taken from two groups of people between 50 and 70 years of age by IR, NES and DNES spectral analysis. The first group consisted of people in excellent health. The second group consisted of people in a critical state and patients with malignant tumors. The average energy of hydrogen bonds ($\Delta E_{\text{H}\dots\text{O}}$) between H_2O molecules in the blood serum was investigated as the main biophysical parameter. The result was registered as a difference between the NES-spectrum of 1% solution of human blood serum and the NES-spectrum of deionized water control sample – DNES-spectrum, measured as the difference $\Delta f(E) = f(\text{samples of water}) - f(\text{control sample of water})$. The DNES-spectrum obtained from the first group has a local extremum energy ($\Delta E_{\text{H}\dots\text{O}}$) at $E = -9.1 \pm 1.1 \text{ meV}$ and from the second group at $E = -1.6 \pm 1.1 \text{ meV}$. The results between the two groups have a statistical difference in Student's criterion at $p < 0.05$. For the control group of healthy people the value of the largest local maximum in the DNES-spectrum was detected at $E = -0.1387 \text{ eV}$, or at a wavelength $\lambda = 8.95 \mu\text{m}$. For the group of people in a critical health state and the patients with malignant tumors, the analogous values of the largest local maximums of the DNES-spectrum shifted to lower energies compared with the control group of people. For a group of people in critical health condition and patients with malignant tumors the greatest values of local extremum in the IR-spectrum are shifted to lower energies relative to the control group. In IR-spectrum of human blood serum are detected 8 local maxima at $\lambda = 8.55, 8.58, 8.70, 8.77, 8.85, 9.10, 9.35$ and $9.76 \mu\text{m}$ (Krasnov, Gordetsov, 2009). The resulting peak at $\lambda = 8.95 \mu\text{m}$ in the IR-spectrum (Ignatov, 2012) approaching the peak at $\lambda = 8.85 \mu\text{m}$ was monitored by Russian researchers. In the control group of healthy people the average value of the energy distribution function $f(E)$ at $\lambda = 8.95 \mu\text{m}$ compiles $E = 75.3 \text{ eV}$, and in a group of people in critical condition – $E = 24.1 \text{ eV}$. The norm has statistically reliable result for human blood serum for the control group of people having cancer at the local extremum of $f(E) \sim 24.1 \text{ eV}^{-1}$. The level of reliability of the results is $p < 0.05$ according to the Student's t-test. In 1995 were performed DNES-experiments with an impact on tumor mice cells in water solutions containing Ca^{2+} (Antonov, 1995). There was a decrease in the DNES-spectrum compared with the control sample of cells from a healthy mouse. The decrease was also observed in the DNES-spectrum of human blood serum of terminally ill people relative to that of healthy people. With increasing of age of long-living blood relatives, the function of distribution of H_2O molecules according to energies at -0.1387 eV decreases. In this group of tested people the result was obtained by the DNES-method at $E = -5.5 \pm 1.1 \text{ meV}$; the difference in age was of 20–25 years in relation to the control group. It should be noted that many of Bulgarian

centenarians inhabit the Rhodopes Mountains areas. Among to the DNES-spectrum of mountain waters the similar to the DNES-spectrum of blood serum of healthy people at $\lambda = 8.95 \mu\text{m}$, was the DNES-spectrum of water in the Rhodopes. The mountain water from Teteven, Boyana and other Bulgarian provinces has similar parameters. Tables 1, 2 and 3 show the composition of mountain water springs in Teteven and Kuklen (Bulgaria) and local extremums in NES-spectra of water samples. The local extremums is water samples were detected at $E = -0.11 \text{ eV}$ and $E = -0.1387 \text{ eV}$. The value measured at $E = -0.11 \text{ eV}$ is characteristic for the presence of Ca^{2+} in water. The value measured at $E = -0.1387 \text{ eV}$ is characteristic for inhibiting the growth of cancer cells. Experiments conducted by A. Antonov with cancer cells of mice in water with Ca^{2+} demonstrated a reduction of this local extremum to a negative value in spectra. Analysis by the DNES-method of aqueous solutions of natural mineral sorbent –zeolite (microporous crystalline aluminosilicate mineral from Most village, Bulgaria) showed the presence of a local extremum at $E = -0.1387 \text{ eV}$ for shungite and $E = -0.11 \text{ eV}$ for zeolite (Mosin & Ignatov, 2013, Ignatov & Mosin, 2014a). It should be noted that owing to the unique porous structures both the natural minerals shungite and zeolite are ideal natural water adsorbers effectively removing from water organochlorine compounds, phenols, dioxins, heavy metals, radionuclides, and color, and gives the water a good organoleptic qualities, additionally saturating water with micro-and macro-elements until the physiological levels (Mosin & Ignatov, 2013). It is worth to note that in Bulgaria the main mineral deposits of Bulgarian zeolites are located in the Rhodope Mountains, whereat has lived the greatest number of Bulgarian centenarians. It is believed that water in these areas is cleared out in a natural way by mineral zeolite.

3.4. Results of 1% (v/v) solution in deionized water of VITA intense

The research with the NES method of water drops is received with 1% solution VITA intense, and deionized water as control sample. The mathematical models of 1% (v/v) solution VITA intense gives the valuable information for the possible number of hydrogen bonds as percent of H_2O molecules with different values of distribution of energies (Table 2 and Fig. 8). These distributions are basically connected with the restructuring of H_2O molecules having the same energies.

Table 2: The distribution (% , $(-E_{\text{value}})/(-E_{\text{total value}})$) of H_2O molecules in 1% water solution of VITA intense (product of LavaVitae, Austria) and control deionized water

-E(eV) x-axis	1% water solution VITA intense (LavaVitae) y-axis $(\%((-E_{\text{value}})*/(-E_{\text{total value}})**))$	Control Sample Deionized water y-axis $(\%((-E_{\text{value}})*/(-E_{\text{total value}})**))$	-E(eV) x-axis	1% water solution VITA intense (LavaVitae) y-axis $(\%((-E_{\text{value}})*/(-E_{\text{total value}})**))$	Control Sample Deionized water y-axis $(\%((-E_{\text{value}})*/(-E_{\text{total value}})**))$
0.0937	0	0	0.1187	0	0
0.0962	0	14.3	0.1212	17.7²	0
0.0987	0	0	0.1237	0	0
0.1012	0	14.3	0.1262	11.7	3.6
0.1037	0	0	0.1287	0	3.6
0.1062	11.7	14.3	0.1312	5.7	7.1
0.1087	0	0	0.1337	11.7	0
0.1112	5.7¹	14.3	0.1362	5.7	7.1
0.1137	0	0	0.1387	30.1³	7.1
0.1162	0	14.3	–	–	–

$E = -0.1112 \text{ eV}$ is the local extremum for relaxing effect on nervous system

$E = -0.1212 \text{ eV}$ is the local extremum for anti-inflammatory effect

$E = -0.1387 \text{ eV}$ is the local extremum for inhibition of development of tumor cells of molecular level

Notes:

* The result $(-E_{\text{value}})$ is the result of hydrogen bonds energy for one parameter of $(-E)$

** The result $(-E_{\text{total value}})$ is the total result of hydrogen bonds energy

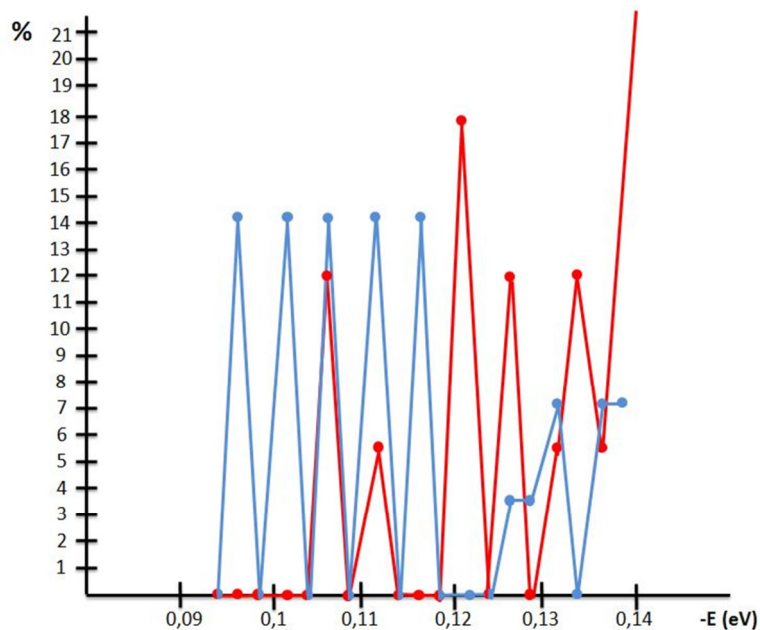


Figure 8: Mathematical model (Ignatov, Mosin, 2013) of 1% water solution of VITA intense (product of LavaVitae, Austria).

Figure 8 shows the distribution $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$ of H_2O molecules in and 1% (v/v) of water solution of VITA intense (product of LavaVitae, Austria) (red line) and control sample deionized water (blue line).

Notes:

$E = -0.1112 \text{ eV}$ is the local extremum for relaxing effect on nervous system

$E = -0.1212 \text{ eV}$ is the local extremum for anti-inflammatory effect

$E = -0.1387 \text{ eV}$ is the local extremum for inhibition of development of tumor cells of molecular level

The experimental data obtained testified the following conclusions from the mathematical model of in 1% (v/v) water solution of VITA intense (product of LavaVitae, Austria) and control deionized water. The distribution $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$ of water molecules in mathematical model of in 1% (v/v) water solution of VITA intense (product of LavaVitae, Austria) and control deionized water. The distribution $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$ of water molecules in VITA intense (product of Lava Vitae, Austria) according control sample is different. However, for the value $E = -0.1387 \text{ eV}$ or $\lambda = 8.95 \mu\text{m}$ there is the biggest local extremum (30.1 $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$) corresponding to the re-structuring of hydrogen bonds among H_2O molecules for inhabitation of development of tumor cells of molecular level. This difference may indicate on the different number of hydrogen bonds in water samples, as well as their physical parameters (pH, ORP), resulting in different distribution of H_2O molecules and different values of H_2O molecules with ratios of $(-E_{\text{value}})/(-E_{\text{total value}})$.

Particularly it was observed the statistical re-structuring of H_2O molecules in water samples according to the energies. The experimental data may prove that stipulates the restructuring of H_2O molecules on molecular level and may be used for the prophylaxis of inhibition of development of tumor cells. For the value $E = -0.1112 \text{ eV}$ or $\lambda = 11.15 \mu\text{m}$ there is the local extremum with sight minus (5.7 $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$) according control sample (14.3 $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$) corresponding to the re-structuring of hydrogen bonds among H_2O molecules. The experimental data may prove that influence stipulates the restructuring of H_2O molecules on molecular level and has biophysical effect for relaxing effect on nervous system. For the value $E = -0.1212 \text{ eV}$ or $\lambda = 10.23 \mu\text{m}$ there is bigger local extremum (17.7 $(\%, (-E_{\text{value}})/(-E_{\text{total value}}))$) corresponding to the re-structuring of hydrogen bonds among H_2O molecules for anti-inflammatory effect. The experimental data for Lava Intense may prove that stipulates the restructuring of H_2O molecules on molecular level and the biophysical effects are:

$E = -0.1112 \text{ eV}$ is the local extremum for relaxing effect on nervous system

$E = -0.1212 \text{ eV}$ is the local extremum for anti inflammatory effect

$E = -0.1387 \text{ eV}$ is the local extremum for inhibition of development of tumor cells of molecular level.

As a result of different energies of hydrogen bonds, the surface tension of 1% (v/v) solutions of water samples with VITA Intense is increasing. The increasing of surface tension is regarding the control samples. This effect is connected with preservation of the energy in human body as result of biochemical process among water molecules and bio molecules.

3.5. VITA intense (product of the company LavaVitae)

The average energy ($E_{H...O}$) of hydrogen H...O-bonds among individual H_2O molecules in 1% (v/v) solution of VITA intense is measured at $E=-0.1261$ eV. The result for the control sample (deionized water) is $E=-0.1125$ eV. The results obtained with the NES method are recalculated with the DNES method as a difference of the NES (1% (v/v) solution of VITA intense) minus the NES (control sample with deionized water) equaled the DNES spectrum of 1% solution of VITA Intense. Thus, the result for 1% solution of VITA intense recalculated with the DNES method is $\Delta E=-0.0136\pm 0.0011$ eV. The result shows the increasing of the values of the energy of hydrogen bonds in 1% (v/v) solution of VITA intense regarding the deionized water. This is effect of stimulation on human body. The result is 12.4 times more than statistical reliable result. The results show restructuring of water molecules in configurations of clusters, which influence usefully on human health on molecular and cellular level. The effects are describing with mathematical model of 1% solution of VITA intense.

3.6. Results for BOOST with methods for methods NES and DNES

The research with the NES method of water drops is received with 1% solution BOOST, and deionized water as control sample. The mathematical models of 1% solution BOOST gives the valuable information for the possible number of hydrogen bonds as percent of H_2O molecules with different values of distribution of energies (Table 3 and Fig. 9). These distributions are basically connected with the restructuring of H_2O molecules having the same energies.

Table 3: The distribution (% $(-E_{value})/(-E_{total value})$) of H_2O molecules in 1% water solution of BOOST (product of LavaVitae, Austria) and control deionized water

-E(eV) x-axis	1% water solution BOOST (LavaVitae) y-axis (%((-E _{value})* (-E _{total value}))**	Control Sample Deionized water y-axis (%((-E _{value})* (-E _{total value}))**	-E(eV) x-axis	1% water solution BOOST (LavaVitae) y-axis (%((-E _{value})* (-E _{total value}))**	Control Sample Deionized water y-axis (%((-E _{value})* (-E _{total value}))**
0.0937	0	0	0.1187	0	0
0.0962	0	12.5	0.1212	22.2 ²	0
0.0987	0	6.2	0.1237	0	12.5
0.1012	0	0	0.1262	0	0
0.1037	0	0	0.1287	0	12.5
0.1062	0	12.5	0.1312	11.1	3.2
0.1087	11.1	6.2	0.1337	11.1	3.2
0.1112	22.2 ¹	0	0.1362	11.1	6.2
0.1137	0	0	0.1387	11.1 ³	0
0.1162	0	12.5	-	-	-

$E=-0.1112$ eV is the local extremum for increasing of nervous conductivity

$E=-0.1212$ eV is the local extremum for anti-inflammatory effect

Notes:

* The result $(-E_{value})$ is the result of hydrogen bonds energy for one parameter of $(-E)$

** The result $(-E_{value})$ is the total result of hydrogen bonds energy

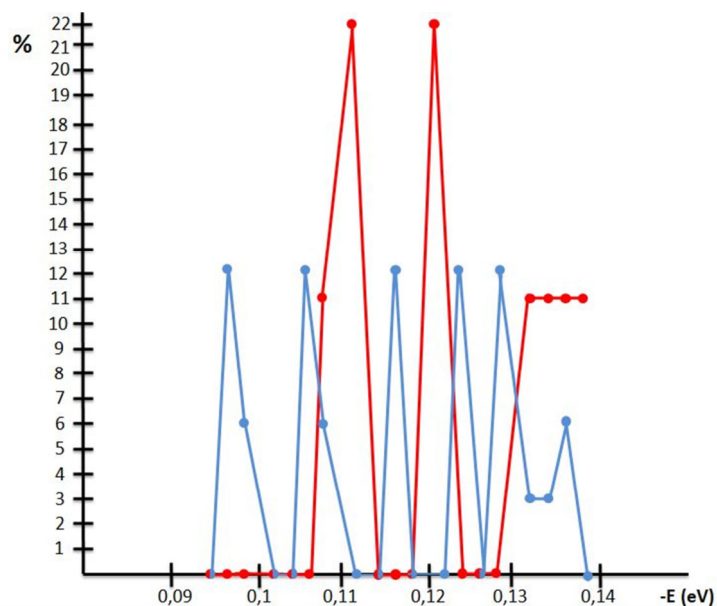


Figure 9: Mathematical model (Ignatov, Mosin, 2013) of 1% water solution of BOOST (product of LavaVitae, Austria).

Figure 9 shows the distribution ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$) of H_2O molecules in and 1% of water solution of BOOST (product of LavaVitae, Austria) (red line) and control sample deionized water (blue line).

Notes:

$E = -0.1112 \text{ eV}$ is the local extremum for improvement of nervous conductivity

$E = -0.1212 \text{ eV}$ is the local extremum for anti-inflammatory effect

The experimental data obtained testified the following conclusions from the mathematical model of in 1% water solution of BOOST (product of LavaVitae, Austria) and control deionized water. The distribution ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$) of water molecules in mathematical model of in 1% water solution of BOOST (product of LavaVitae, Austria) and control deionized water. The distribution ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$) of water molecules in BOOST (product of LavaVitae, Austria) according control sample is different. However, for the value $E = -0.1387 \text{ eV}$ or $\lambda = 8.95 \mu\text{m}$ there is the bigger local extremum (22.2 ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$)) corresponding to the re-structuring of hydrogen bonds among H_2O molecules for inhabitation of development of tumor cells of molecular level.

This difference may indicate on the different number of hydrogen bonds in water samples, as well as their physical parameters (pH, ORP), resulting in different distribution of H_2O molecules and different values of H_2O molecules with ratios of $(-E_{\text{value}})/(-E_{\text{total value}})$. Particularly it was observed the statistical re-structuring of H_2O molecules in water samples according to the energies. The experimental data may prove that stipulates the restructuring of H_2O molecules on molecular level and may be used for the prophylaxis of inhibition of development of tumor cells. For the value $E = -0.1112 \text{ eV}$ or $\lambda = 11.15 \mu\text{m}$ there is the local extremum (22.2 ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$)) according the re-structuring of hydrogen bonds among H_2O molecules. The experimental data may prove that influence stipulates the restructuring of H_2O molecules on molecular level and has biophysical effect improvement of conductivity of nervous system. For the value $E = -0.1212 \text{ eV}$ or $\lambda = 10.23 \mu\text{m}$ there is the bigger local extremum (22.2 ($\%, (-E_{\text{value}})/(-E_{\text{total value}})$)) corresponding to the re-structuring of hydrogen bonds among H_2O molecules for anti-inflammatory effect.

The experimental data for BOOST may prove that stipulates the restructuring of H_2O molecules on molecular level and the biophysical effects are:

$E = -0.1112 \text{ eV}$ is the local extremum for improvement of nervous conductivity

$E = -0.1212 \text{ eV}$ is the local extremum for anti-inflammatory effect

As a result of different energies of hydrogen bonds, the surface tension of 1% solution of water samples with BOOST is increasing. The increasing of surface tension is regarding the control samples. This effect is connected with preservation of the energy in human body as result of biochemical process among water molecules and bio molecules;

3.7. BOOST (product of the company LavaVitae)

The average energy ($E_{\text{H}\dots\text{O}}$) of hydrogen $\text{H}\dots\text{O}$ -bonds among individual H_2O molecules in 1% solution of BOOST is measured at $E = -0.1259 \text{ eV}$. The result for the control sample (deionized water) is $E = -0.1155 \text{ eV}$. The results obtained with the NES method are recalculated with the DNES method as a difference of the NES (1%

solution of BOOST) minus the NES (control sample with deionized water) equaled the DNES spectrum of 1% solution of BOOST. Thus, the result for 1% solution of BOOST recalculated with the DNES method is $\Delta E = -0.0114 \pm 0.0011$ eV. The results show the increasing of the values of the energy of hydrogen bonds in 1% solution of BOOST regarding the deionized water. This is effect of stimulation on human body. The result is 10.4 times more than statistical reliable result. The results show restructuring of water molecules in configurations of clusters, which influence usefully on human health on molecular and cellular level. The effects are describing with mathematical model of 1% solution of BOOST.

3.8. Results with pH and ORP

There are valid the following results of pH as indicator for acid alkaline medium of the products of LavaVitae. There are the results also of ORP or Oxidation-reduction potential.

The results are for 1% (v/v) of solutions of products, which are made from deionized water. This research is performed with Georgi Gluhchev from Bulgarian Academy of Science. The results of pH of deionized water is 6.05 and of ORP is 119.7. Table 4 shows the results of pH and ORP.

Table 4. Results of products of company LavaVitae for pH and ORP

Product	pH	ORP (mV)	Coordinates Fig. 11
VITA Intense	4.07±0.02	- 104.5	Point 1 (4,07; -104.5)
BOOST	3.60±0.02	+113.6	Point 2 (3,90;113.6)
ZEOLITH detox	8.01±0.02	+109.5	Point 3 (8,01;103.3)
Deionized water	6.05±0.02	+119.7	

Figure 10 shows the dependence between the acidity and basicity (pH) of electrochemically activated solutions and the oxidation-reduction potential (ORP). The pH value within the interval from 3 to 10 units and the ORP within the interval from -400 mV to +900 mV characterize the area of the biosphere of microorganisms. Outside these ranges of pH and ORP the microorganisms will hardly survive.

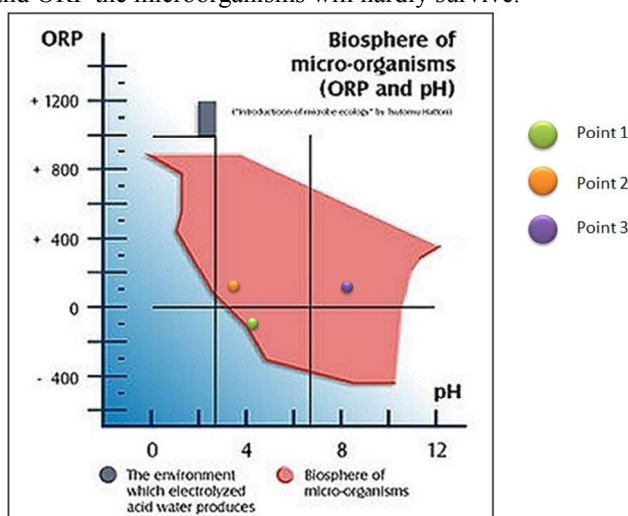


Figure 10: The dependence between acidity and basicity (pH) of solutions and the ORP on the biosphere of micro-organisms (point 1; VITA Intense), (point 2; BOOST), point 3; ZEOLITH detox).

The result of 1% (v/v) solution of VITA intense is 4.07 or acidic medium. The result of ORP is (-104.5). The result of ORP with negative charge is connected with charge with negative value, which has antioxidant and permanent antioxidant activity. In the VITA intense there are the following antioxidants – Vitamins C, E, D. Figure 10 shows the dependence between acidity and basicity (pH) of solutions and the ORP on the biosphere of micro-organisms. The result of VITA Intense with point 1 with coordinates (4,07; -104.5) is the biosphere of micro-organisms. VITA Intense is useful for human health.

The result of 1% solution of BOOST is 3.60 or acidic medium. The result of ORP is (113.6). Figure 10. shows the dependence between acidity and basicity (pH) of solutions and the ORP on the biosphere of micro-organisms. The result of BOOST with point 2 is with coordinates (3.60; -113.6) is the biosphere of micro-organisms. Boost is useful for human health.

3.9. Effects of Ca^{2+} , Mg^{2+} , Zn^{2+} and Mn^{2+} in water on biophysical and biochemical processes in the human body

The research of distribution of local extremums (eV^{-1}) in spectra of various water samples as a function of distribution of H_2O molecules according to energy $f(E)$ at $\lambda = 8.95 \mu m$ shows the analogue extremum at analogous values of $f(E)$, E and λ , which was detected in water with Ca^{2+} ions earlier demonstrated inhibiting the growth of cancer cells. Magnesium (Mg^{2+}), zinc (Zn^{2+}) and manganese (Mn^{2+}) ions dissolved in water have influence on enzymes, which are antioxidants (Ignatov & Mosin, 2015a). The research of China team was categorized three groups of elements from the rice and drinking water according to their effect on longevity: Sr, Ca, Al, Mo, and Se, which were positively correlated with longevity; Fe, Mn, Zn, Cr, P, Mg, and K, which had a weak effect on local longevity, and Cu and Ba, which had a negative effect on longevity (Lv et al., 2011). There was a positive correlation between the eSOD activity and the age and a negative correlation between the eSOD activity and concentration of Zn^{2+} in plasma. An inverse correlation was also found between the content of Zn^{2+} ions in plasma relative to the age. The prevalence of Zn^{2+} deficiency is increased with age; with normal Zn^{2+} levels it is observed in about 80% of adult people and only in 37 % of the non-agenarians. Aging is an inevitable biological process that is associated with gradual and spontaneous biochemical and physiological changes and the increased susceptibility to diseases. Because the nutritional factors are involved in improving the immune functions, metabolic balance, and antioxidant defense, some nutritional factors, such as Zn, may modify susceptibility to disease and promote healthy aging. *In vitro* (human lymphocytes exposed to endotoxins) and *in vivo* (old or young mice fed with low zinc dietary intake) studies revealed that zinc is important for immune efficiency (innate and adaptive), antioxidant activity (superoxide dismutase), and cell differentiation *via* clusterin/apolipoprotein J. The intracellular Zn homeostasis is regulated by metallothioneins (MT) *via* an ion release through the reduction of thiol groups in the MT molecule (Mocchegiani, 2007). Zinc in composition of water improves the antioxidative enzymes in red blood cells (Malhotra & Dhawan, 2008).

The magnesium deficiency and oxidative stress have both been identified as pathogenic factors in aging and in several age-related diseases. The link between these two factors is unclear in humans although, in experimental animals, severe Mg^{2+} deficiency has been shown to lead to the increased oxidative stress (Begona et al, 2000). The antioxidants against free radical damage include tocopherol (vitamin E), ascorbic acid (vitamin C), β -carotene, glutathione, uric acid, bilirubin, and several metalloenzymes including glutathione peroxidase (Se), catalase (Fe), and superoxide dismutase (Cu, Zn, Mn) and proteins such as ceruloplasmin (Co). The extent of the tissue damage is the result of the balance between the free radicals generated and the antioxidant protective defense system (Machlin & Bendich, 1988). There was reported the antioxidant effects of water on rats (Abdullah, 2012). The norm in water for Zn^{2+} and Mg^{2+} according to the World Health Organization (WHO) should be less than 20 μg . For the Na^+ content the norm according to the WHO is less than 20 mg.

The interesting results on the concentration of Ca^{2+} in water were obtained in USA and Canada. According to the statistical information the most number of centenarians in Canada per 1 million of population is observed in Nova Scotia (210 of centenarians per 1 million). In the water from Nova Scotia the Ca^{2+} content makes up 6.8 mg/l. N. Druzhyak, Russia showed that in the places wherein live the most number of centenarians the Ca^{2+} content in water was 8–20 mg/l. The only risk factor regarding the increased Ca^{2+} content in water is cardiovascular diseases.

The following reactions occur in water if there are high concentrations of Ca^{2+} and Mg^{2+} ions: the reaction of limestone ($CaCO_3$) and gypsum ($CaSO_4 \cdot 2H_2O$) with water to separate the calcium (Ca^{2+}), carbonates (CO_3^{2-}) and sulfate (SO_4^{2-}) ions. By increasing the mineralization of water the content of Ca^{2+} ions decreases. During the concentration of the solutions Ca^{2+} ions are precipitated. With the increase of carbon dioxide (CO_2) in water and decreasing of the pH value the content of Ca^{2+} increases. The reaction of interaction of dolomite ($CaCO_3 \cdot MgCO_3$) with water makes the formation of Mg^{2+} ions. Hydrocarbonates (HCO_3^-) and carbonates (CO_3^{2-}) ions are formed by reaction of interaction of karst rocks, CO_2 and water. For example, in Zamzam water there is $Ca^{2+} - 299.7 \text{ mg/l}$; $Mg^{2+} - 18.9 \text{ mg/l}$; $Zn^{2+} - 0.001 \text{ mg/l}$.

4. Conclusion

From the NES and DNES spectrum and mathematical model of 1% (v/v) solution of VITA intense and deionized water as control sample are valid the following conclusions for biophysical effects for VITA Intense (LavaVitae company)

- relaxing effect on nervous system;
- anti inflammatory effect;
- inhibition of development of tumor cells of molecular level;

In 1% (v/v) solution of VITA intense there is restructuring of water molecules in configurations of clusters, which influence usefully on human health on molecular and cellular level.

The biophysical effects of VITA intense are connected also with antioxidant effects. The VITA intense is recommended as anti aging solution for prophylaxis (Ignatov, Gluhchev, Karadzhov et al. 2015). The scientific

studies show that the inflammations are one of the basic reasons for aging. The recommendation is connected with additionally using or including in VITA intense of the additional mineral. The structuring of water clusters with highest energy of hydrogen bonds at $8.95 \mu\text{m}$ makes the water in human body more “active” as medium of biochemical and biophysical processes. This is similar like the human organism to be younger (Ignatov, Mosin, 2012). The quality of the water with which will be using is very important. There are types of water which will increase the effects. For these effects is recommended additional scientific project with pH is in progress.

As a result of different energies of hydrogen bonds, the surface tension of 1% (v/v) solutions of water samples with VITA intense is increasing. The increasing of surface tension is regarding the control sample. This effect is connected with preservation of the energy in human body as result of biochemical process among water molecules and bio molecules;

It worth to note that IR-spectrum of VITA intense is most similar to the IR-spectrum of blood serum of healthy group of people with a local extremum at $\lambda=8.95 \mu\text{m}$. The similar spectral characteristics possess mountain water from Teteven and other Bulgarian sources electrochemically activated water catholyte (Ignatov et al., 2014). The basic research is with Kangen device (Ignatov, Mosin, Kirov, 2016) Studying the human blood serum by NES and DNES-methods show that by measuring the average energy of hydrogen bonds among H_2O molecules and the distribution function of H_2O molecules on energies it is possible to show a vital status of a person and associated life expectancy. Our data indicates that water in the human body has the IR-spectrum resembling the IR-spectrum of human blood serum. On the characteristics of the IR-spectrum of water also exerts an influence the presence of deuterium in water samples. In the research there is the optimal composition of mountain and melt water from areas where are lived the long live people and centenarians. The decreased content of deuterium in studied water samples with residual deuterium content of 60-100 ppm, the variety of ions (K^+ , Na^+ , Ca^{2+} , Mg^{2+} , Mn^{2+} , Fe^{2+} , Fe^{3+} , Zn^{2+} , SO_4^{2-} , Cl^- , HCO_3^- , CO_3^{2-}), and chemical-physical parameters (pH, electroconductivity) of studied water samples renders beneficial effects of this type of water on human health. We have also obtained new proofs for biophysical and biochemical effects of Ca^{2+} , Mg^{2+} , Zn^{2+} and Mn^{2+} in composition of water on human organism and DNES-spectra of water. There are obtained new results of chemical composition of water from Glacier Rosenloui, Swiss Alps.

From the NES and DNES spectrum and mathematical model of 1% (v/v) solution of BOOST and deionized water as control sample are valid the following conclusions for biophysical effects for BOOST (LavaVitae company)

- improvement of conductivity of nervous system;
- anti-inflammatory effect;

In 1% (v/v) solution of BOOST there is restructuring of water molecules in configurations of clusters, which influence usefully on human health on molecular and cellular level.

The biophysical effects of BOOST are connected also with stimulating effects. The BOOST is recommended as anti aging solution from anti-inflammatory effect (Ignatov, Gluhchev, Karadzhev et al. 2015). The scientific studies show that the inflammations are one of the basic reasons for aging. There are types of water which will increase the effects. For these effects is recommended additional scientific project with pH is in progress.

As a result of different energies of hydrogen bonds, the surface tension of 1% (v/v) solutions of water samples with BOOST is increasing. The increasing of surface tension is regarding the control sample. This effect is connected with preservation of the energy in human body as result of biochemical process among water molecules and bio molecules.

References:

- Abdullah, A.M., Abdelsalam, E., Abdullah, B. & Khaled, A. (2012) Antioxidant Effects of Zamzam Water in Normal Rats and Those Under Induced-oxidant Stress, *Journal of Medicinal Plants Research*, **6**(42):5507-5512.
- Adelman, R., Saul, R. & Ames, B. (1988) Oxidative damage to DNA: relation to species metabolic rate and life span, *PNAS*, **85**(8): 2706-2708.
- Antonov, A. (1995) Research of the Non-equilibrium Processes in the Area in Allocated Systems. Dissertation thesis for degree “Doctor of physical sciences”, Blagoevgrad, Sofia.
- Antonov, A. & Yuskesseliava, L. (1985) Selective high frequency discharge (Kirlian effect). *Acta Hydrophysica*, **5**: 29.
- Atanasov, A., Karadzhev, S., Ivanova, E., Mosin, O.V. & Ignatov I. (2014) Study of the effects of electrochemical aqueous sodium chloride solution (anolite) on the virus of classical swine fever virus. Mathematical models of anolyte and catolyte as types of water. *Journal of Medicine, Physiology and Biophysics*, **4**: 1–26.
- Begona, M. et al. (2000) Magnesium Status and Parameters of the Oxidant-Antioxidant Balance in Patients with Chronic Fatigue: Effects of Supplementation with Magnesium, *Journal of American College for Nutrition*, **19** (3): 374-382.

- Balentine, D. et al. (1997) The chemistry of Tea Flavonoids, *Food Science and Nutrition*, **37** (8) 693-70
- Bell, D. R.&Goshenaur, K. (2006) Direct Vasodilatative Properties of Anthocyanin-Rich Extract, *J. Appl. Physiol.*, **100**: (1164-1170).
- Batista et al. (2009) Prospective Double-blind Crossover Study of Camellia Sinensis (Green tea) in Dyslipidemias, *Arq. Bras. Cardiol.*, **93** (2):128-134.
- Berdishev, G.G. (1989) *Reality and Illusion of Immortality Longevity*, Moscow, Politizdat, 1-89 [in Russian].
- Berdishev, G.G. (1989) Reality and Illusion of Immortality Longevity. – Moscow: Politizdat, 1989. [in Russian].
- Bermudez–Soto et al. (2007) Stability of Polyphenols in Chokeberry (*Aronia melanocarpa*) Subjected to *in vitro* Gastric and Pancreatic Digestion, *Food Chemistry*, **102** (3): 865-874.
- Borisova et al. (2004) Hepatoprotective Effect of the Natural Fruit Juice from Aronia melanocarpa on Carbon Tetrachloride-induced Acute Liver Damage in Rats, *Exp. Toxicol. Pathol.* **56** (3): 195-201.
- Brubach, J.B., Mermet, A., Filabozzi, A., Gerschel, A. & Roy, P. (2005) Signatures of the Hydrogen Bonding in the Infrared Bands of Water. *J. Chem. Phys.*, **122**: 184509.
- Burger, O., Baudish, A. & Vaupel, J. W. (2012) Human Mortality Improvement in Evolutionary Context, *PNAS*, **109**(44): 18210–18214.
- Chan E-V et al. (2011) Antioxidant and Antibacterial Properties of Green, Black, and Herbal Teas of *Camellia sinensis*, **3**(4): 266-272.
- Chacko, S. et al. Beneficial Effects of Green Tea: A literature Review, *Chinless Medicine*, 5-13.
- Choi et al. (2001) The Green Tea Polyphenol(-)epigallocatechin Gallate Attenuates Beta-amyloid-induced Neurotoxicity in Cultured Hippocampal Neurons, *Life Sci.*, **70** (5): 603-614.
- Chan M-Y (1997) Inhibition of Inducible Nitric Oxide Synthase Gene Expression and Enzyme Activity by Epigallocatechin Gallate, a Natural Product from Green Tea, *Biochemical Pharmacology*, **54** (12): 1281–1286
- Costa, S. et al. (2009) In vitro Evaluation of the Chemoprotective Action Mechanisms of Leontopodic Acid Against Aflatoxin B1 and Deoxynivalenol-induced Cell Damage, *J Appl Toxicol.*, **29** (1):7-14.
- Choi T.N. & Jordan K.D. (2010) Application of the SCC-DFTB Method to $H^+(H_2O)_6$, $H^+(H_2O)_{21}$, and $H^+(H_2O)_{22}$. *J. Phys. Chem. B*, **114**, 6932–6936.
- Davis, R.H. (1989) Wound Healing, Oral & Topical Activity of Aloe Vera, *J. Am. Podiatr. Med. Assoc.*, **79** (11): 559-562.
- Dobner, M. et al. (2003) Antibacterial Activity of *Leontopodium alpinum* (Edelweiss), *Journal of Ethnopharmacology*, **89** (2-3): 301-303.
- Druzhyak, N. G. (2005) Water for Health and Longevity, *Neva*. [in Russian].
- Eisenberg, D. & Kauzmann, W. (1969) The Structure and Properties of Water. *Oxford University Press*, London.
- Gluhchev, G., Ignatov, I., Karadzhov, S., Miloshev, G., Ivanov, N.& Mosin, O.V. (2015) Electrochemically Activated Water. Biophysical and Biological Effects of Anolyte and Catholyte as Types of Water, *Journal of Medicine, Physiology and Biophysics*, **10**: 1-17.
- Goryainov S.V. (2012) A Model of Phase Transitions in Double-well Morse Potential: Application to Hydrogen Bond. *Physica B*, **407**, 4233–4237.
- Gluhchev, G., Ignatov, I., Karadzhov, S., Miloshev, G., Ivanov, N.&Mosin, O.V.(2015) Studying the Antimicrobial and Antiviral Effects of Electrochemically Activated NaCl Solutions of Anolyte and Catholyte on a Strain of E. Coli DH5 and Classical Swine Fever (CSF) Virus, *European Journal of Medicine*, **9** (3): 124-138.
- Esua, M., Rauwald, J-W. (2006) Novel Bioactive Maloyl Glucans from Aloe vera Gel: Isolation, Structure Elucidation and *In Vitro* Bioassays, *Carbohydrate Research*, **341** (3): 355-364.
- Gluhchev, G., Ignatov, I., Karadzhov, S., Miloshev, G., Ivanov, I. & Mosin, O. V. (2015) Studying of Virucidal and Biocidal Effects of Electrochemically Activated Anolyte and Catholyte Types of Water on Classical Swine Fever Virus (CSF) and Bacterium E. coli DH5, *Journal of Medicine, Physiology and Biophysics*, **13**:1-17.
- Hollman, P., Tjiburg, L.&Yang, C. (1997) Bioavailability of Flavonoids from Tea, *Crit. Rev. Food Sci. Nutr.*, **37**: 719-738.
- Howard, C. & Hopps (1986) Chemical Qualities of Water that Contribute to Human Health in a Positive Way, *Science of the Total Environment*, **54**: 207-216.
- Ignatov, I., Mosin, O. V. & Naneva, K. (2012) Water in the Human Body is Information Bearer about Longevity. *Euromedica*, Hanover: 110-111.
- Ignatov I. (2012) Conference on the Physics, Chemistry and Biology of Water, Water in the Human Body is Information Bearer about Longevity, NY, Vermont Photonics.
- Ignatov I. & Mosin, O.V. (2013) Possible Processes for Origin of Life and Living Matter with Modeling of Physiological Processes of Bacterium *Bacillus subtilis* in Heavy Water as Model System. *Journal of Natural Sciences Research*, **3**(9): 65-76.

- Ignatov, I. & Mosin, O.V. (2013) Modeling of Possible Processes for Origin of Life and Living Matter in Hot Mineral and Seawater with Deuterium. *Journal of Environment and Earth Science*, **3**(14): 103-118.
- Ignatov, I. & Mosin, O.V. (2014) The Structure and Composition of Carbonaceous Fullerene Containing Mineral Shungite and Microporous Crystalline Aluminosilicate Mineral Zeolite. Mathematical Model of Interaction of Shungite and Zeolite with Water Molecules. *Advances in Physics Theories and Applications*, **28**: 10-21.
- Ignatov, I. & Mosin, O.V. (2013) Structural Mathematical Models Describing Water Clusters. *Journal of Mathematical Theory and Modeling*, **3**(11): 72-87.
- Ignatov, I., Mosin, O.V., Velikov, B., Bauer, E. & Tyminski, G. (2014) Longevity Factors and Mountain Water as a Factor. Research in Mountain and Field Areas in Bulgaria, *Civil and Environmental Research*, **6** (4): 51-60.
- Ignatov, I., Mosin, O.V. & Velikov, B. (2014) Longevity Factors and Mountain Water of Bulgaria in Factorial Research of Longevity, *Journal of Medicine, Physiology, Biophysics*, **1**:13-33.
- Ignatov, I., Mosin, O.V., Velikov, B., Bauer, E. & Tyminski, G. (2014) Research of Longevity Factors and Mountain Water as a Factor in Teteven Municipality, Bulgaria, *Journal of Medicine, Physiology and Biophysics*, **2**: 37-52.
- Ignatov, I. & Mosin, O. V. (2014) Nature of Hydrogen Bonds in Liquids and Crystals. Ice Crystal Modifications and Their Physical Characteristics, *Journal of Medicine, Physiology and Biophysics*, **4**: 58-80.
- Ignatov, I., Mosin, O.V., Velikov, B., Bauer, E. & Tyminski, G. (2014) Research of Longevity Factors and Mountain Water as a Factor in Teteven, Yablanitsa and Ugarchin Municipalities, Lovech Region, Bulgaria, *Journal of Health, Medicine and Nursing*, **4**: 21-36.
- Ignatov, I. Mosin, O.V., Velikov, B. Bauer, E. & Tyminski, G. (2014) Mountain Water as Main Longevity Factor in Research of Phenomenon of Longevity in Mountain Areas in Bulgaria, *European Journal of Molecular Biotechnology*, **4** (2): 52-71.
- Ignatov, I. & Mosin, O. V. (2014a) Hydrogen Bonds among Molecules in Liquid and Solid State of Water. Modifications of Ice Crystals, *Journal of Health, Medicine and Nursing*, **5**: 56-79.
- Ignatov, I. & Mosin, O.V. (2014b) Methods for Measurements of Water Spectrum. Differential Non-equilibrium Energy Spectrum Method (DNES), *Journal of Health, Medicine and Nursing* **6**: 50-72.
- Ignatov, I. & Mosin, O.V. (2014c) Isotopic Composition of Water as Main Factor for Longevity, *Drug Development and Registration*, **9** (4): 146-155. [in Russian].
- Ignatov, I., Mosin, O. V., Velikov, B. & Bauer, E. (2014) Influence of Isotopic Composition of Water with Varying Deuterium Content in Composition with Mountain Water of Bulgaria on Human Longevity, *Journal of Medicine, Physiology and Biophysics*, **7**: 46-78.
- Ignatov, I., Karadzhov, S., Atanasov, A., Ivanova, E. & Mosin, O.V. (2014) Electrochemical aqueous sodium chloride solution (anolyte and catholyte) as types of water. Mathematical models. Study of effects of anolyte on the virus of classical swine fever virus. *Journal of Health, Medicine and Nursing*, **8**: 1-28.
- Ignatov, I., Mosin, O.V. & Velikov, B. (2015) Mountain Water as a Factor of Human Longevity. Local Extremum at 8.95 μm in Spectrum of Water as Indicator for Health and Longevity, *Journal of Medicine, Physiology and Biophysics*, **9**: 51-81.
- Ignatov, I. & Mosin, O.V. (2015a) Methods for Research of Mountain and Melt Water as Factor of Longevity. Chemical Composition, NES and DNES Methods for Spectral Analysis. Effects of Calcium, Magnesium, Zinc and Manganese, *Advances in Physics Theories and Applications*, **44**: 48-64.
- Ignatov, I. & Mosin, O.V. (2015b) Water: Solid and Liquid Phases. Nano Structures in the Water in Solid and Liquid Phases, *Journal of Medicine, Physiology and Biophysics*, **9**: 82-109.
- Ignatov, I., Mosin, O.V., Kirov, P. (2016) Mathematical Model of Kangen Water®. Biophysical and Biochemical Effects of Catholyte, *Advances in Physics Theories and Applications*, **20**: 33-55.
- Ignatov, I., Gluhchev, G., Karadzhov, S., Miloshev, G., Ivanov, I. & Mosin, O. V. (2015) Preparation of Electrochemically Activated Water Solutions (Catholyte/Anolyte) and Studying of their Physical-Chemical Properties, *Journal of Medicine, Physiology and Biophysics*, **13**:18-38.
- Ignatov, I. & Mosin, O.V. (2015) Nanostructures in Solid and Liquid Phases of Water, *Journal of Medicine, Physiology and Biophysics*, **12**:31-57.
- Ignatov, I. & Mosin, O. V. (2014) Isotopic Composition of Water as Main Factor for Longevity, *Drug Development and Registration*, **9** (4): 146-155.
- Ignatov, I. & Mosin, O.V. (2015) Methods for Research of Mountain and Melt Water as Factor of Longevity. Chemical Composition, NES and DNES Methods for Spectral Analysis. Effects of Calcium, Magnesium, Zinc and Manganese, *Advances in Physics Theories and Applications*, **44**:48-64.
- Ignatov, I., Mosin, O.V. & Bauer, E. (2015) Vortex Power Spring Water: Physical-Chemical Qualities of this Water compared to Mountain and Melt Water from Bulgaria, Russia and Glacier Rosenlauri from Swiss

- Alps, *Advances in Physics Theories and Applications*, **45**:6-29 .
- Gluhchev, G., Ignatov, I., Karadzhov, S., Miloshev, G., Ivanov, N. & Mosin, O.V. (2015) Electrochemically Activated Water: Biophysical and Biological Effects of Anolyte and Catholyte Types of Water, **7**. (1): 12-26.
- Ignatov, I., Mosin, O.V., Karadzhov, S., Miloshev, G.&Ivanov, N. (2015) The Evaluation of Mathematical Model of Interaction of Electrochemically Activated Water Solutions (Anolyte and Catholyte) with Water, *European Reviews of Chemical Research*, **2** (4): 72-86.
- Ignatov, I. (2016) Product of LavaVitae BOOST is Increasing of Energy of Hydrogen Bonds among Water Molecules in Human Body, *Journal of Medicine, Physiology and Biophysics*, **27**: 30-42.
- Ignatov, I. (2016) VITA intense – Proofs for Anti-inflammatory, Antioxidant and Inhibition Growth of Tumor Cells Effects. Relaxing Effect of Nervous System. Anti Aging Influence, *Journal of Medicine, Physiology and Biophysics*, **27**: 43-61.
- Ignatov, I. et al. (2016) Results of Biophysical and Nano Technological Research of ZEOLITH detox of LavaVitae Company, *Journal of Health, Medicine and Nursing*, **30**: 44-49.
- Isaacs E.D., Shukla A., Platzman P.M, et all. (2000) Compton scattering evidence for covalency of the hydrogen bond in ice, *J. Phys. Chem. Solids*, **61**, 403–406.
- Krastev, D., Ignatov, I., Mosin, O. V., Penkov, P. (2016) Research on the Effects of the ‘Dance of the Spiral’ Methodology, with Spectral Analysis of Water Extracts, upon the Physiological Parameters of Plants and the Essential Oil Content, *Advances in Physics Theories and Applications*, **52**: 47-55.
- Keutsch F. & Saykally R. (2011) Water Clusters: Untangling the Mysteries of the Liquid, One Molecule at a Time. *PNAS*, **98**(19), 105330–10540.
- Krastev, D., Ignatov, I., Mosin, O.V.&Penkov, P. (2016) Research of the Effects of the “Dance of the Spiral Metrology” upon the Physiological Parameters of the Plants and the Essential Oil Content, *European Journal of Molecular Biotechnology*, **11**: 29-39.
- Kokotkiewicz, A., Jaremicz, Z.&Luczkiewicz, M. (2010) Aronia Plants: A Review of Traditional Use, Biological Activities, and Perspectives for Modern Medicine, *Journal of Medicinal Food*, **13** (2):255-269.
- Krasnov, V.V. & Gordetsov, A.S. (2009) Infrared spectral analysis of blood serum as level of disturbances of metabolic processes in infusion children pathology. *Clinical Medicine*: 83–94 [in Russian].
- Kulling, S.E.&Rawel, H.M. (2008) Aronia Melanocarpa - A Review on the Characteristic Components and Potential Health Effects, *Planta Medica*, **74** (13):1625-34.
- Kuriyama et al. (2006) Green Tea Consumption and Mortality due to Cardiovascular Disease, Cancer, and all Causes in Japan: The Ohsaki Study, *The Journal of the American Medical Association*, **296** (10): 1255–1265.
- Lala, G. et al. (2006) Anthocyanin-rich Extracts Inhibit Multiple Biomarkers of Colon Cancer in rats, *Nutr. Cancer*, **54**: 84-93.
- Lambert, J. D., Yang, C. S. (2003) Mechanism of Cancer Prevention by Tea Constituents, *Journal of Nutrition*, **133** (10): 3262S:3267S.
- Lis, G., Wassenaar, L.I. & Hendry, M.J. (2008) High-precision laser spectroscopy D/H and ¹⁸O/¹⁶O Measurements of microliter natural water samples. *Anal. Chem.*, **80**(1): 287-293.
- Liu K., Cruzan J.D. & Saykally R.J. (1996) Water Clusters. *Science Magazine*, **271**(5251), 929–933.
- Loboda O. & Goncharuk V. (2010) Theoretical Study on Icosahedral Water Clusters. *Chemical Physics Letters*, **484**(4–6), 144–147.
- Lis, G., Wassenaar, L.I. & Hendry, M.J. (2008) High-precision Laser Spectroscopy D/H and ¹⁸O/¹⁶O Measurements of Microliter Natural Water Samples. *Anal. Chem.*, **80**(1): 287–293.
- Lv.J., Wang, W., Krafft, T., Li, Y., Zhang, F.&Yuan, F. (2011) Effects of Several Environmental Factors on Longevity and Health of the Human Population of Zhongxiang, Hubei, China, *Biol. Trace Elem. Res.*, **143** (2):702:716.
- Lulli D et al. (2012) Anti-Inflammatory Effects of Concentrated Ethanol Extracts of Edelweiss (Leontopodium alpinum Cass.) Callus Cultures towards Human Keratinocytes and Endothelial Cells, *Hindawi Publishing Corporation Mediators of Inflammation*: 1-12.
- Luck W., Schiöberg D. & Ulrich S. (1980) Infrared Investigation of Water Structure in Desalination Membranes. *J. Chem. Soc. Faraday Trans.*, **2**(76), 136–147.
- Machlin, L. J., Bendich, A. (1988) Free Radical Tissue Damage: Protective Role of Antioxidant Nutrients, *The FACEB journal*, **1**(6): 441-445.
- Maheshwary S., Patel N., Sathyamurthy N., Kulkarni A.D. & Gadre S.R. (2001) Structure and Stability of Water Clusters (H₂O)_n, n = 8-20: An Ab Initio Investigation. *J. Phys. Chem.*, **105**, 10525–10537.
- Mariani, E. et al. (2006) Antioxidant Enzyme Activities in Healthy Old Subjects: Influence of Age, Gender and Zinc Status: *Results from the Zincage Project, Biogerontology*, **7** (5-6): 391:398.

- Malhotra, A., & Dhawan, D. K. (2008) Zinc Improves Antioxidative Enzymes in Red Blood Cells and Hematology in Lithium-Treated rats, *Nutr. Res.*, **28**(1):43-50
- Malik, M. et al. (2003) Anthocyanin-rich Extract from Aronia Meloncarpa Induces a Cell Cycle Block in Colon Cancer but not Normal Colonic Cells, *Nutr. Cancer*, **46**:186-196.
- Matsumoto, M. et al. (2004) Gastroprotective Effect of Red Pigments in Black Chokeberry Fruit (*Aronia melanocarpa* Elliot) on Acute Gastric Hemorrhagic Lesions in Rats, *J. Agric. Food Chem.*, **52** (8): 2226-2229.
- Michaelides A. & Morgenstern K. (2007) Ice Nanoclusters at Hydrophobic Metal Surfaces. *Nat. Mat.*, **6**: 597–599.
- Mocchegiani, E. (2007) Zinc, Metallothioneins, and Longevity- Effect of Zinc Supplementation: Zincage Study, *Ann N. Y. Acad. Sci.*, **1119**: 129-146.
- Mosin, O.V. & Ignatov, I. (2012a) Isotope effects of deuterium in bacterial and microalgae cells at growth on heavy water (D₂O). *Voda: Himia i Ecologija*, **3**, 83–94 [in Russian].
- Mosin, O.V. & Ignatov I. (2012b) Separation of heavy isotopes deuterium (D), tritium (T) and oxygen (¹⁸O) in water treatment. *Clean Water: Problems and Decisions (Moscow)*. 2012. № 3–4. 69-78 [in Russian].
- Mosin, O.V. & Ignatov, I. (2013) The structure and composition of natural carbonaceous fullerene containing mineral shungite, *International Journal of Advanced Scientific and Technical Research*, **6**(11-12): 9-21.
- Pasichnyk I. Everaers R. & Maggs A.C. (2008) Simulating van der Waals-interactions in water/hydrocarbon-based complex fluids. *J. Phys. Chem. B*, **112**(6), 1761–1764.
- Pauling L. (ed.) (1960) *The Nature of the Chemical Bond and the Structure of Molecules and Crystals*. New York: Cornell University Press.
- Pimentel G.C. & McClellan A.L. (1960) *The hydrogen bond* (L. Pauling, Ed). New York: Reinhold Publishing Co.
- Pocock, S.J, Shaper, A.G. & Packham, R.F. (1981) Studies of Water Quality and Cardiovascular Disease in the United Kingdom, *Sci. Total Environ.*, **18**: 25–34.
- Olas, B. et al. (2008) Comparative Anti-platelet and Antioxidant Properties of Polyphenol-rich Extracts from Berries of Aronia Melanocarpa, Seeds of Grape and Bark of Yucca Schidigera in vitro, *Platelets*, **19** (1):70-7.
- Orgel, L. (1963) The maintenance of the accuracy of protein synthesis and its relevance to aging, *Biochemistry*, **49**: 517–521.
- Reisinger, U. et al. (2009) Leogin, the Major Lignin from Edelweiss, Inhibits Intimal Hyperplasia of Venous Bypass Graphs, *Cardiovascular Research*, **82**: 524-549.
- Ryszawa et al. (2006) Effects of Novel Plant Antioxidants on Platelet Superoxide Production and Aggregation Atherosclerosis, *J Physiol Pharmacol*, **57**: 611-626
- Saykally, R. (2005) Unified description of temperature-dependent hydrogen bond rearrangements in liquid water. *PNAS*, **102**(40): 14171–14174.
- Simon, M. et al. (2006) How Much Calcium Is in Your Drinking Water? A Survey of Calcium Concentrations in Bottled and Tap Water and Their Significance for Medical Treatment and Drug Administration, *HSS Journal*, **2**(2): 130–135.
- Shelton, R.M. (1991) Aloe Vera: Its Chemical and Therapeutic Properties, *Int. Journal Dermatol*, **30**: 679-683.
- Schwalger, S. et al. (2005) Leontopodic acid—a Novel Highly Substituted Glucaric Acid Derivative from Edelweiss (*Leontopodium alpinum* Cass.) and its Antioxidative and DNA Protecting Properties, *Tetrahedron*, **61**(19): 4621-4630.
- Schwalger, S. et al. (2006) Development of an HPLC-PAD-MS Assay for the Identification and Quantification of Major Phenolic Edelweiss (*Leontopodium alpinum* Cass.), *Phytochemical Analysis*, **17** (5) 291:298.
- Speroni et al. (2006) In Vivo Efficacy of Different Extracts of Edelweiss (*Leontopodium alpinum* Cass.) in animal models, *Journal of Ethnopharmacology*, **89** (2-3): 301-303.
- Sykes M. (2007) Simulations of RNA Base Pairs in a Nanodroplet Reveal Solvation-Dependent Stability. *PNAS*, **104**(30), 12336–12340.
- Tokmachev A.M., Tchougreeff A.L. & Dronkowski R. (2010) Hydrogen-Bond Networks in Water Clusters (H₂O)₂₀: An Exhaustive Quantum-Chemical. *European Journal of Chemical Physics and Physical Chemistry*, **11**(2), 384–388.
- Tsai C.J. & Jordan K.D. (1993) Theoretical Study of the (H₂O)₆ Cluster. *Chem. Phys. Letters*, **213**, 181–188.
- Valcheva-Kuzmanova, S.V. & Belcheva, A. (2006) Current Knowledge of Aronia Melanocarpa as a Medicinal Plant. *Folia Med.*, **48** (2):11-7.
- Valcheva-Kuzmanova, S.V, et al. (2005) Effect of *Aronia Melanocarpa* Fruit Juice on indomethacin-induced Gastric Mucosal Damage and Oxidative stress in Rats, *Experimental and Toxicological Pathology*, **56** (6):385-392.
- Vazquez, B. et al. (1996) Anti-inflammatory Activity of Extracts Aloe Vera Gel, *J. Ethnopharmacol*, **55**: 69-75.

- Vogler, B.K., Ernst. E. (1999) Aloe Vera a Systematic Review of the Clinical Effectiveness, *Br. J. Gen.* 825-828.
- Wang H. et al. (1997) Oxygen Radical Absorbing Capacity of Anthocyanins, *J. Agric. Food Chem.*, **45**: 304-309.
- Wang F & Jordan K.D. (2003) A Parallel Tempering Monte Carlo Investigation of $(\text{H}_2\text{O})_6^-$. *J. Chem. Phys.*, **119**, 11645–11653.
- Wang et al. (2007) Leoligin, the Major Lignan from Edelweiss (*Leontopodium nivale* subsp. *alpinum*), Promotes Cholesterol Efflux from THP-1 Macrophages, *J. Nat. Prod.*, **79**(6): 1651–1657.
- Woodhead, R. (1984) *Molecular Biology of Aging*. NY, Basic Life Science, **35**, pp. 34–37.
- Yang DJ et al. (2007) Effects of Different Steeping Methods and Storage on Caffeine, Catechins and Gallic Acid in Bag Tea Infusions, *Journal of Chromatography A*, **1156**: 312–320.
- Yuan, Y.&Shao, Y. (2002) Systematic Investigation of Alkali Metal Ion transfer Across the Micro-and-nano-water/1,2-dichloroethane interfaces facilitated by dibenzo-18-crown-6, *The Journal of Physical Chemistry B*, **106** (32): 7809–7814.
- Zink, A. et al. (2014) Outbreak of *Microsporium audouinii* in Munich – the Return of Infectious Fungi in Germany, *Mycose*, **57** (12): 765-770.
- Zhao, C. et al. (2004) Effects of Commercial Anthocyanin-rich Extracts on Colonic Cancer and Nontumorigenic Colonic Cell Growth. *J Agric Food Chem.*, **52** (20):6122-8.
- Zheng, W., Wang, S. Y. (2003) Oxygen Radical Absorbing Capacity of Phenolics in Blueberries, Cranberries, Chokeberries, and Lingonberries, *J. Agric. Food Chem.*, 502-509.
- Zheng, W., Wang, S.Y. (2003) Oxygen Radical Absorbing Capacity of Phenolics in Blueberries, Cranberries, Chokeberries and Lingonberries, *J. Agric Food Chem.*, **51** (2) 502-509.